PolyGard® Gas Controller DGC-03

Digital Gas Controller for up to 16 Gas Transmitters

Serial Number _ADTX3_00X

User Manual

October, 2011

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GADGC03_E_1011

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Digital Gas Controller DGC-03

1 Intended Use

The PolyGard® measuring, controlling and evaluating system DGC-03 (**D**igital **G**as **C**ontroller) is used for detecting and warning of toxic and combustible gases and vapours in the ambient air, mainly in multi-storey and underground car parks.

The DGC-03 Gas Controller fulfills the requirements according to VDI 2053 (January 04), German regulations for car parks, ÖNORM and NVN 2443 for the stationary monitoring of carbon monoxide (CO), nitrogen dioxide (NO2) and combustible gases.

The Gas Controller is suitable for the connection of up to 16 digital gas transmitters of the ADTX3 and µGard series. Up to four alarm thresholds are free programmable per measuring point (MP). Each alarm threshold can be assigned to one of the maximum 14 alarm relays (RX). With its up to 5 analog output signals (4-20 mA) the Gas Controller can be used for the continuously various activation of frequency converters etc.

The free adjustable parameters and alarm threshold enable a very flexible use in the gas measuring technique. Simple and comfortable commissioning is possible thanks to the configuration with pre-set parameters.

Configuration, parameter settings and operation are done via the logical, easy system menu structure without specific programming knowledge.

The intended sites within the ambient conditions as specified in the Technical Data are all areas being directly connected to the public low voltage supply, e.g. residential, commercial and industrial ranges as well as small enterprises (according to EN50 082).

The PolyGard® Gas Controller DGC-03 must not be used in potentially explosive atmospheres.

Prior to commissioning it is essential to consider the guidelines for wiring and commissioning of the hardware.

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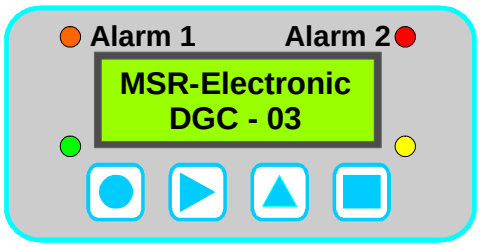
2 Operating Instruction

The complete configuration, parameterization and service are made via keypad user interface in combination with the display screen. Security is provided via four password levels against unauthorised intervention.



2.1 Description Keypad User Interface

Exits programming and saves settings, returns to the previous menu level.

Enters submenus, save setting.

Scrolls up in main menu and submenus, increases or decreases a value.

Moves the cursor

LED orange: Flashes when alarm one or more alarms are active.
Permanently on, when at least one relay is manually operated.

LED red: Flashes when alarm two or more alarms are active.
Permanently on, when at least one relay is manually operated.

LED yellow: Flashes at system or sensor failure or when maintenance needed.

LED green: Power LED

2.2 Setting / Changing Parameters or Set points

Open desired menu window.

Code window opens, if no code level approved.

After inputting the valid code the cursor jumps on the first position segment to be changed.

Push the cursor onto the position segment, which is to be changed.

Change the parameter / set point.

Save the changed value.

Finished

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2.3 Code Levels

All inputs and changes are protected by a four-digit numeric code (= password) against unauthorised intervention. All menu windows are visible without entering a code.

Level 1: (1234)
Code level 1 allows the operator to acknowledge alarms and to manually activate the alarm relays.

Level 2:
Code level is intended for the service technician to change parameters and set-points.

Level 3:
With code level 3 it is possible to register and deregister transmitters in addition to code level 2. This code is released by MSR-E only in emergency situations.

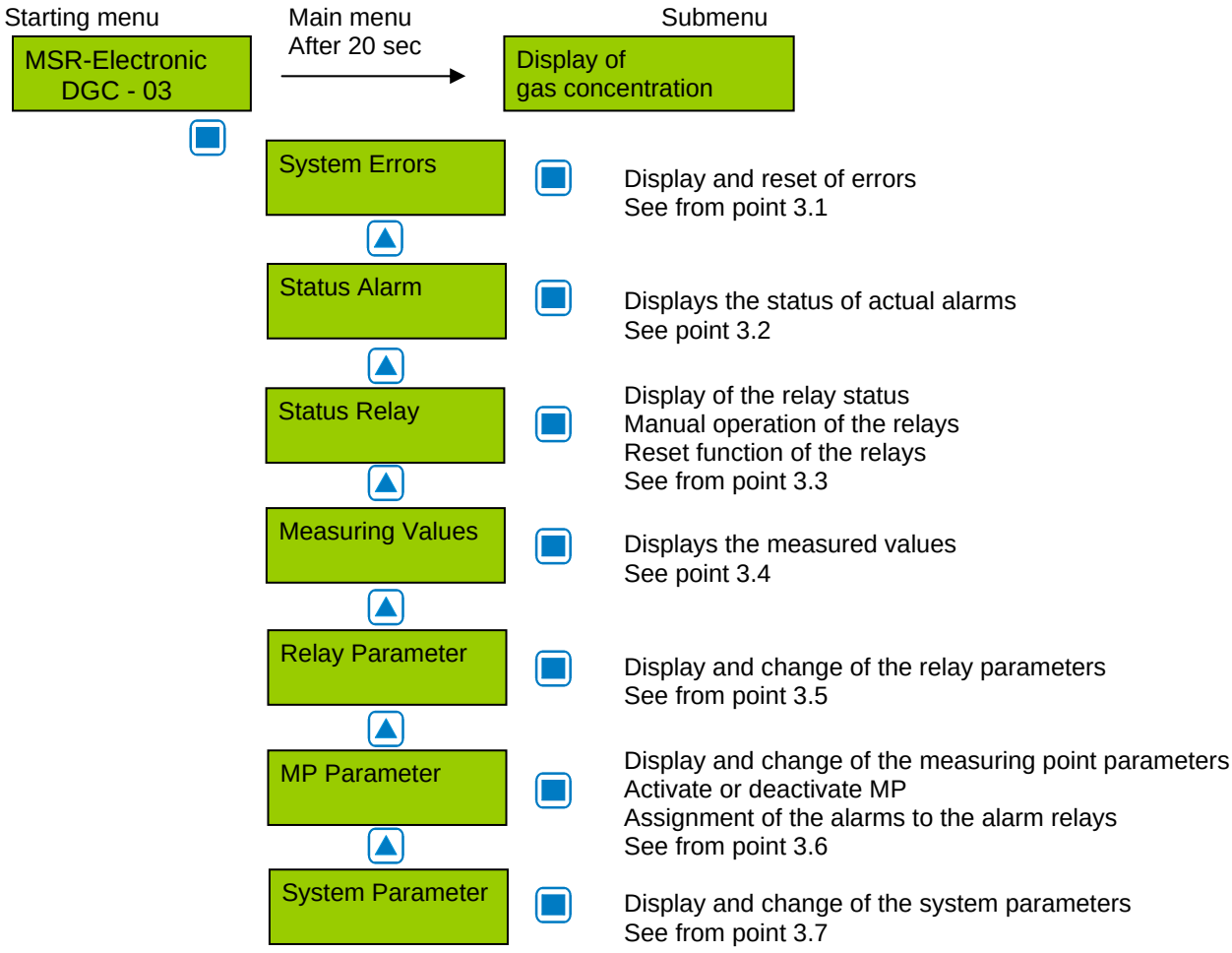
Level 4:
Code level 4 is intended for updating the maintenance date. Normally the code is only known by the service technician and can be changed individually via code level 2.

The release of a code level is cancelled if no button is pushed within 15 minutes.

3 Menu Overview

The operation of the Gas Controller DGC-03 is done via a simple and logical menu structure which is easy to learn. The operating menu contains the following levels:

- Starting menu: Scrolling of the measuring points of all registered transmitters in 10-second intervals.
- Main menu
- Submenu 1 and 2



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3.1 Fault Management

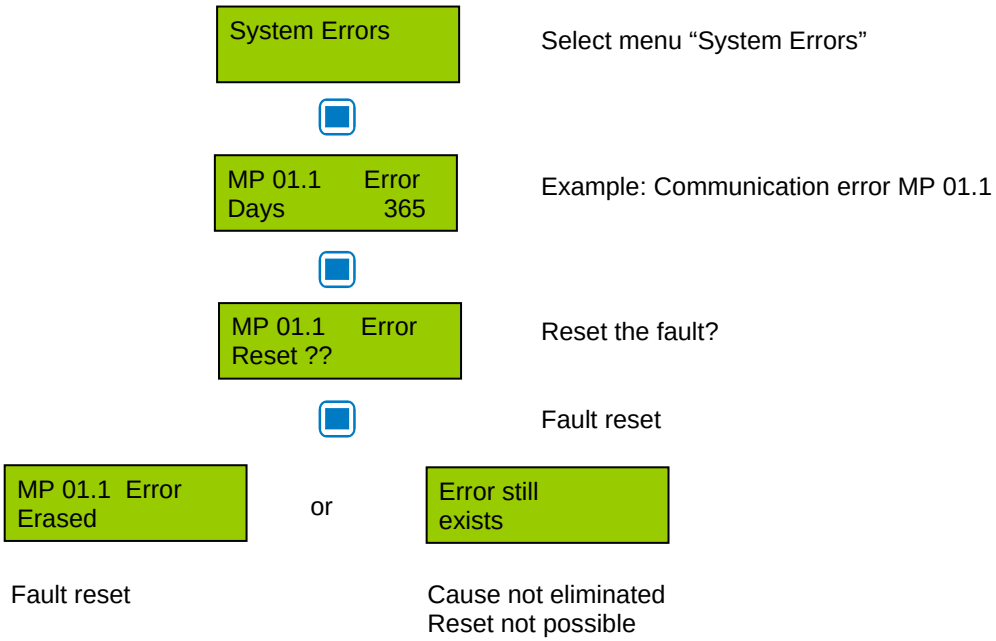
The integrated fault management records the last 15 faults in the menu “System Errors” with a stamp indicating how many days the error has already existed. The day counter subtracts active ones from 365. Additionally a record of the faults occurs in the “Error Memory”, which can be selected and reset only by the service technician.

An actual fault is displayed in plain text in the starting menu. The failure relay which is defined in the system parameter “Failure relay” is activated. The yellow LED in the front of the gas controller flashes.

In case of fault of a measuring point (MP) the alarms defined in the menu “MP Parameter” are activated additionally.

3.1.1 Acknowledge a Fault

Attention:
Acknowledging a fault is only possible after having removed the cause.



3.1.2 Error Memory

The menu “Error Memory“ in the main menu “System Error” can only be opened via code level 2.

In the error memory the last 15 faults even those already acknowledged in the menu “System Error” are listed for the service technician. The deletion of each individual message is effected in the same way as the reset of a fault.

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3.1.3 System Errors

The following system error messages are recorded:

MP XX.1 Error	Communication error to transmitter MP XX.1
Cause:	Bus line interrupted or short-circuit. MP XX.1 registered at the controller, but not addressed, transmitter defective.
Solution:	Check line to transmitter, check transmitter address, replace transmitter
MP XX.1 Overrange **MP XX.1 Underrange**	Sensor signal at the transmitter out of the measuring range.
Cause:	Transmitter not calibrated, defective.
Solution:	Calibrate transmitter, replace transmitter.
MP XX.2 > 22 mA	Current signal at analog input for transmitter MP XX > 22 mA.
Cause:	Short-circuit at analog input, AT transmitter not calibrated, defective.
Solution:	Check cable to AT transmitter, perform calibration, replace AT transmitter.
MP XX.2 < 3 mA	Current signal at analog input MP XX < 3 mA.
Cause:	Wire break at analog input, AT transmitter not calibrated, defective.
Solution:	Check cable to AT transmitter, perform calibration, replace AT transmitter.
GC Error:	Internal communication error I/O Board to LCD Board.
Cause:	Internal error.
Solution:	Replace the Gas Controller.
EP 0X Error	Communication error to expansion module EP 0X. (Only active, if EP 0X is registered).
Cause:	EP module address not correct. (See Commissioning) Bus cable to EP 0X module interrupted. No power supply at the EP 0X module. EP module defective.
Solution:	Check and correct the EP module address. Check bus line and power supply. Replace EP 0X module.
Maintenance:	System maintenance is necessary.
Cause:	Maintenance date exceeded.
Solution:	Perform maintenance.

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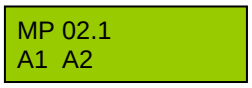
3.2 Status Alarm

Display of the actual alarms in plain text in the order of their arrival. Only those measuring points are displayed, where at least one alarm is active. Changes are not possible in this menu.



Symbol	Description	Function
MP 02	Measuring Point No.	
AX	Status alarm	A1 = Alarm 1 ON A2 = Alarm 2 ON A3 = Alarm 3 ON A4 = Alarm 4 ON

3.3 Status Relay

Display of the actual status of alarm relays. Manual operation of the alarm relays.

Symbol	Description	Setting Status	Function
R 01	Relay No. 01		Select Relay No.
OFF	Status relay	OFF	OFF = Relay OFF (No gas alarm) ON = Relay ON (Gas alarm) Manual OFF = Relay manual OFF Manual ON = Relay manual ON

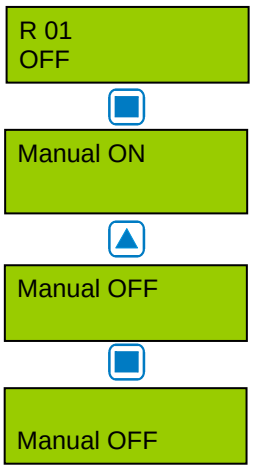
3.3.1 Manual Operation of the Relays

The manual operation of the alarm relays is managed in the menu “Status Relay”. If a relay is in the manual ON or OFF status, the orange/ red alarm LED at the Gas Controller is lit continuously.

The external operation of the alarm relay via an assigned digital input has priority to the manual operation in the menu "Status Relay" and to gas alarm.

Relays manually operated in the menu “Status Relay” are deleted again by selecting the function "Automatic".

Acknowledging the relays in latching mode is also effected in this menu.



Select the relay

Select the function of manual operation

Select the function

Manual ON	= Relay ON
Manual OFF	= Relay OFF
Automatic	= Delete manual operation.
Reset?	= Reset of a latching mode.

Take over the function

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3.4 Menu Measuring Values

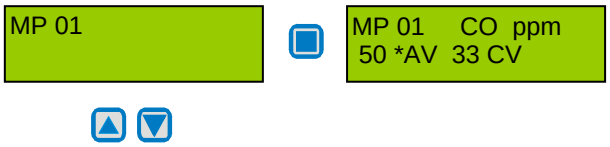
This menu is for displaying the current value (CV) or the average value (AV) with gas unit and gas type for each active measuring point according to the defined mode of control (CV or AV mode). For gas type CO both values are displayed together.
MP 01.**1** = Measured value of the bus transmitter with MP address 01.
MP 01.**2** = Measured value of the analog transmitter connected to the bus transmitter via MP address 01.

The MP address and the display depend on the installed software.

In the version without analog transmitters at the 4 to 20 mA input of the DT- 05 the addresses are listed from MP-01 to MP 16.

In the version with additional analog transmitters the addresses are listed from 1 to 8 with the index XX.1 for the measured value of the bus transmitter and with XX.2 for the measured value of the analog transmitter.

Display for software version 16 bus transmitters



Display for software version 8 bus transmitters and 8 analog transmitters

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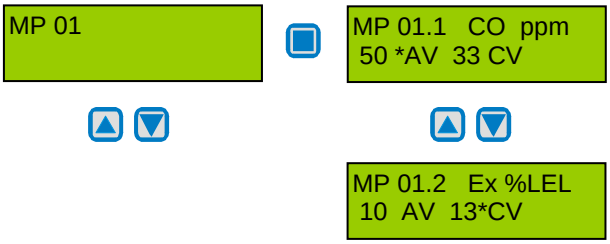

Symbol	Description	Default	Function
MP **01**	Measuring point No.		Bus transmitter with address 01
MP XX.**1**	Measured value		Measured value bus transmitter at address XX
MP XX.**2**	Measured value		Measured value analog transmitter at bus transmitter with address XX
CO	Gas type		See 3.6.2
ppm	Gas unit		See 3.6.2
CV	Current value		Current value of gas concentration
AV	Average value		Average value (10 measured values within the time unit)
*	Control mode		Display of selected control mode (CV or AV)
Not active	Status MP		MP not active
Error	Fault MP		Current signal < 3 mA or > 22 mA

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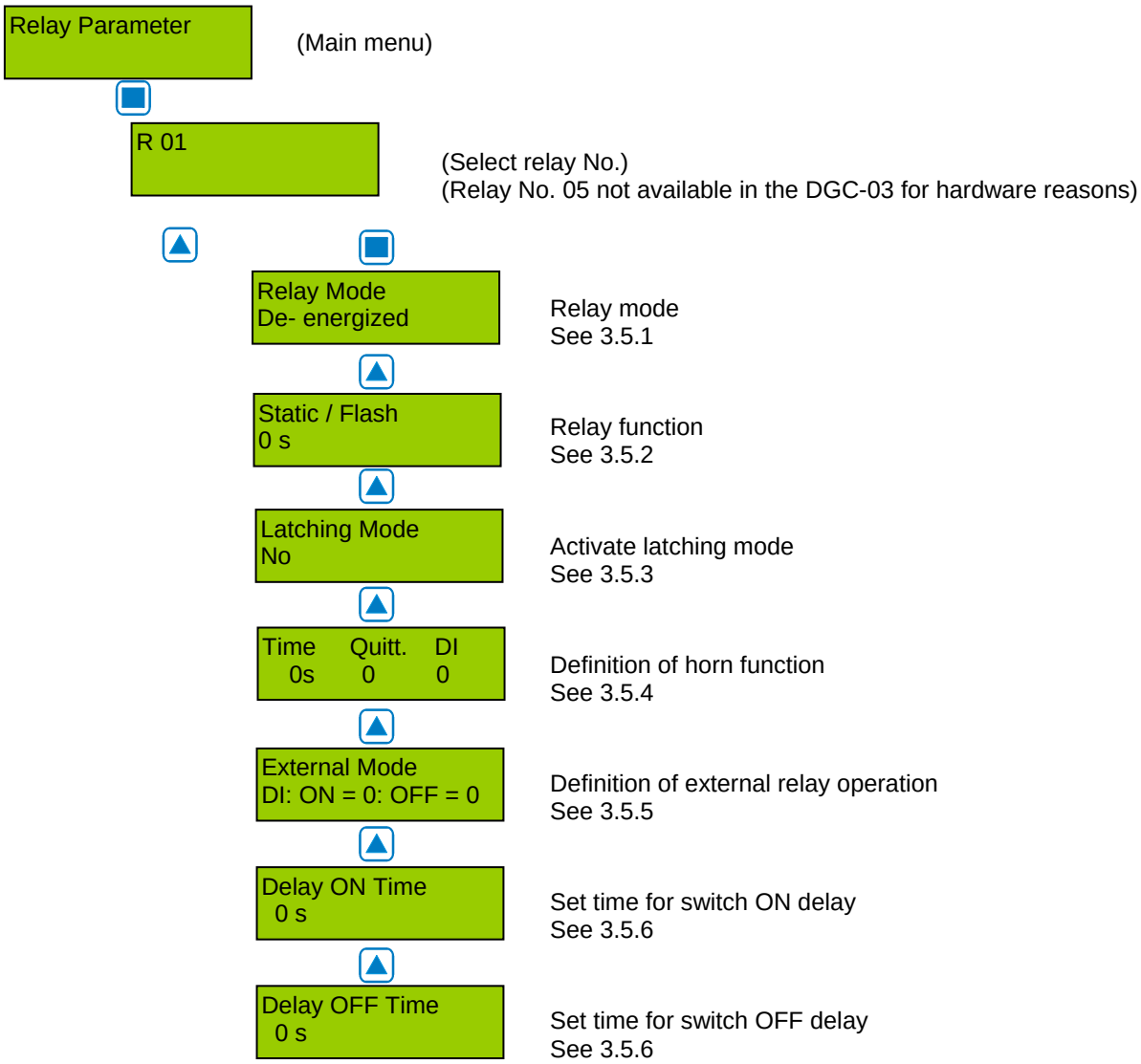
3.5 Menu Relay Parameters

Display and change of the parameters for each alarm relay.



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3.5.1 Relay Mode

Definition of relay mode:

Symbol	Description	Setting Status	Function
R 01	Relay No.		Selection of relay
De-energized	Relay Mode	De-energized	De-energized = Alarm ON = Relay ON Energized = Alarm ON = Relay OFF

3.5.2 Relay Function Static / Flash

Definition of relay function

Symbol	Description	Setting Status	Function
R 01	Relay No.		Selection of relay
0	Function	0	0 = Relay function static > 0 = Relay function flashing (= Time period in sec.) Impulse / Break = 1:1

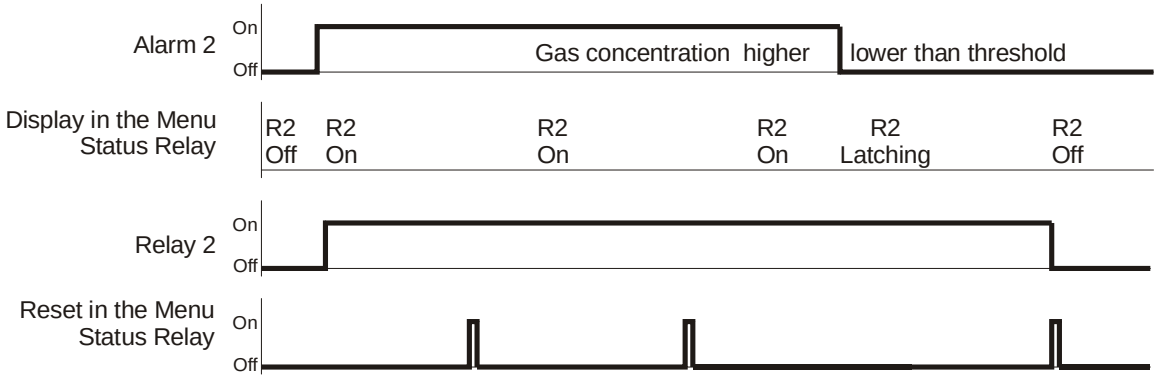
3.5.3 Latching Mode

Definition of latching function

Symbol	Description	Setting Status	Function
R 01	Relay No.		Selection of relay
No	Latching Mode	No	No = Latching mode non active Yes = Latching mode active

Acknowledging a latching relay in the menu “Status Relay“ is only possible if the gas concentration is again lower than the alarm threshold including hysteresis. In this case the status latching occurs in the display.

Example: Alarm relay R2 with latching mode



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3.5.4 Horn Function

The alarm relay is defined as horn relay by this parameter with the following possibilities to reset.

- By pressing any of the 4 push-buttons (only possible in the starting menu).
- Automatic reset at the end of the fixed time.
- By an external push-button (assignment of the digital input).

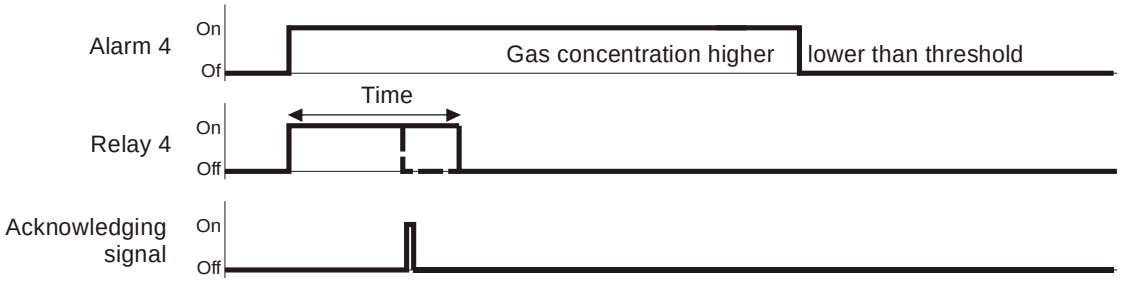
The horn function is only activated if at least one of the two parameters (time or digital input) is set.

Special function Response

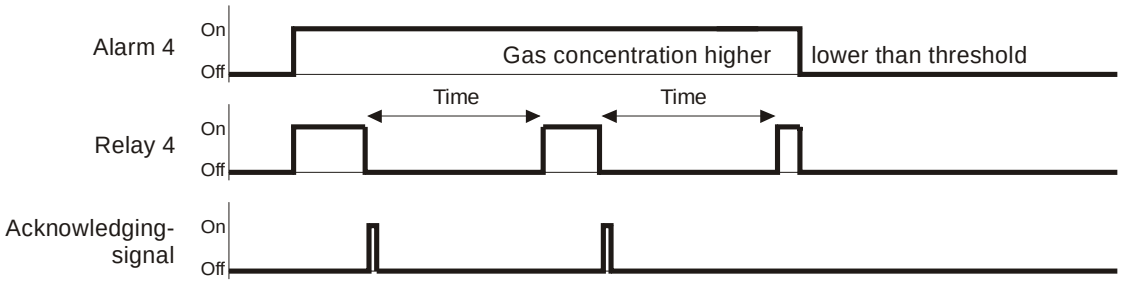
After acknowledging the relay (by push-button or externally) time starts. When this time has run out and the alarm is still acting, the relay is set again.

Symbol	Description	Setting Status	Function
R 04	Relay No.		Selection of relay
Quitt	Mode	0	0 = Reset of the relay after time having run out, or by push-button 1 = Reset of the relay by push-button, after time having run out and when alarm is still acting, relay is set again. (Response function).
Time		120	Time for automatic reset function or response function 0 = no reset function
DI		0	Assignment, which digital input resets the relay.

Acknowledge the horn relay



Special function „Response“. (Return of the horn relay)



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3.5.5 External Relay Operation

Assignment of the digital input (DI) for external switching of the alarm relay (ON and/or OFF). This function has priority to gas alarm and/or manual switching in the menu “Status Relay“.

Symbol	Description	Setting Status	Function
R 01	Relay No.		Relay Selection
DI-ON	External On	0	If digital input closed, relay switches ON
DI-OFF	External Off	0	If digital input closed, relay switches OFF

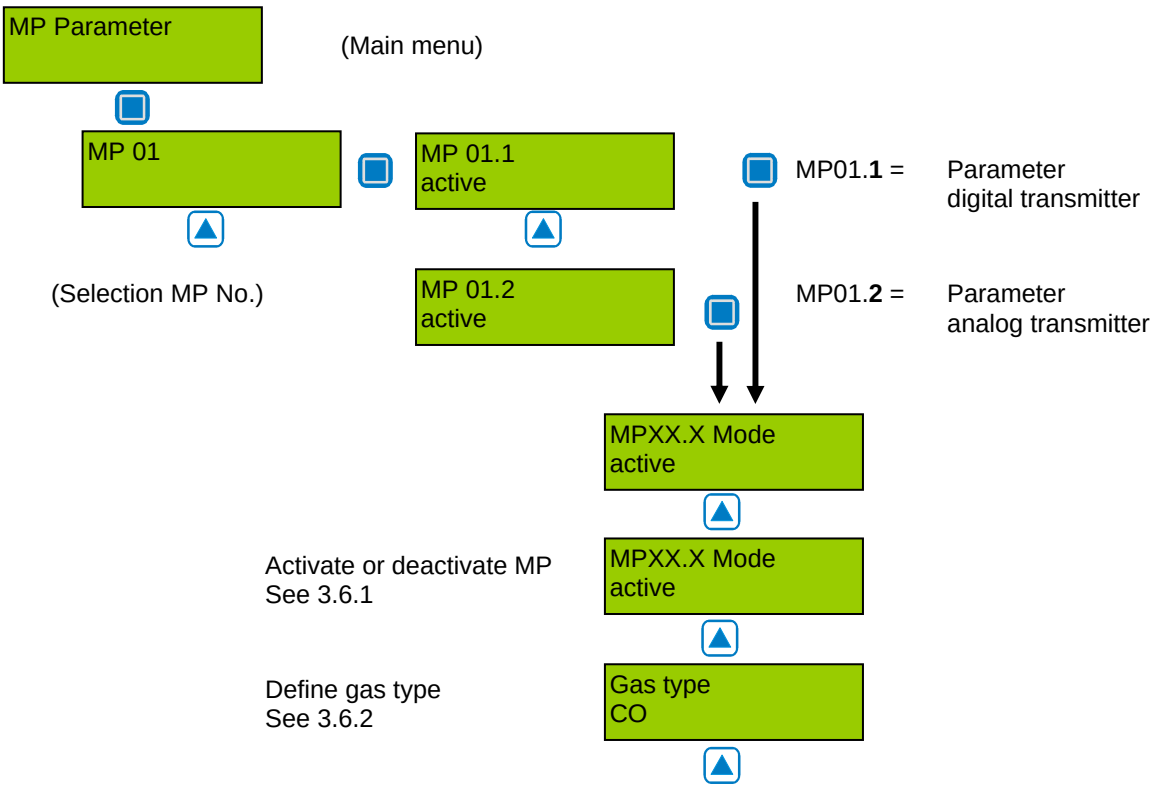
3.5.6 Delay Mode of the Relay.

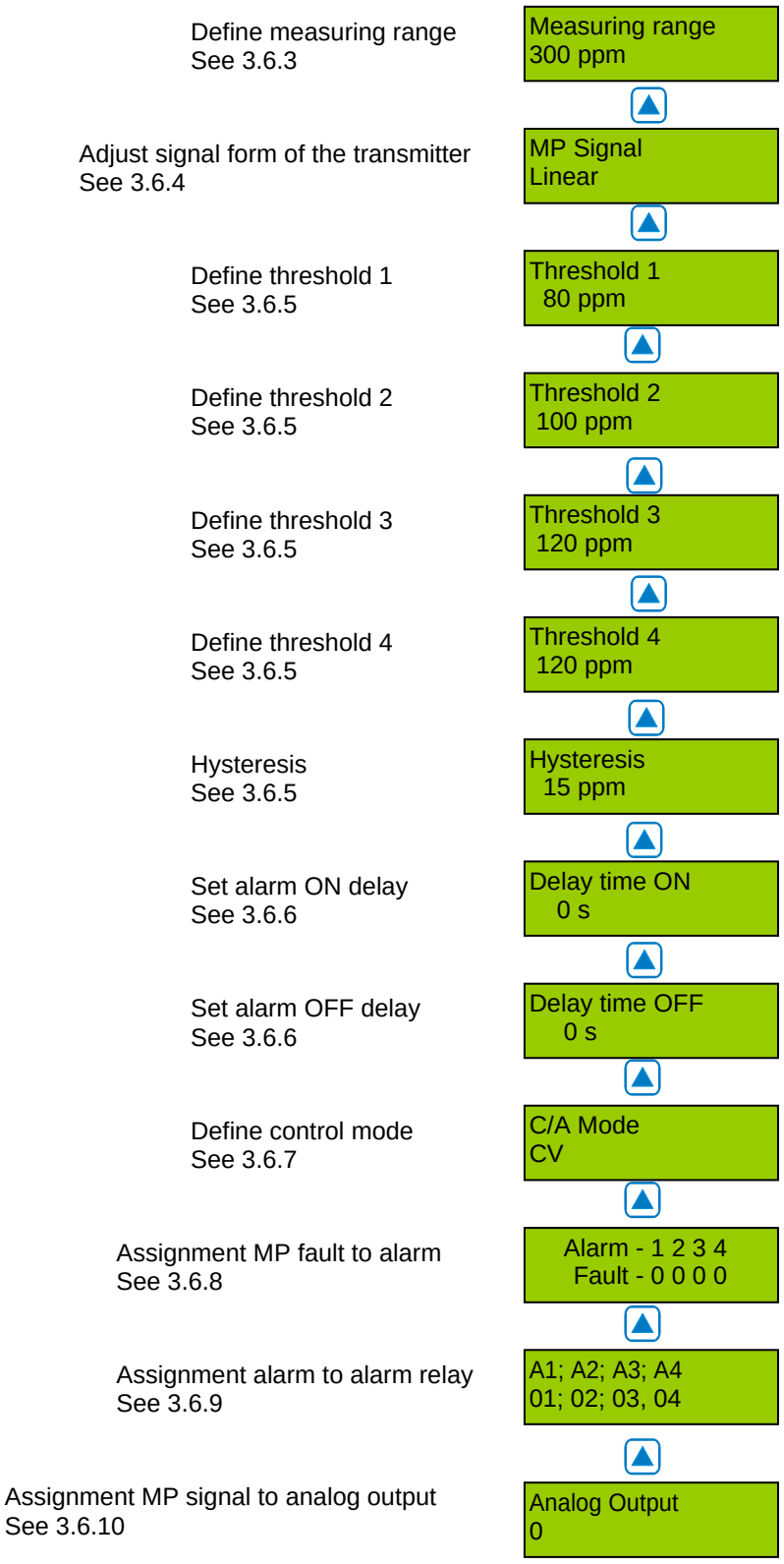
Delay time ON starts when the alarm is released and/or delay time OFF starts when the alarm returns to normal condition.

Symbol	Description	Setting Status	Function
R 01	Relay No.		Relay Selection
0 s	Delay Time ON	0	Mode ON: Relay is only activated at the end of the defined time (sec.) 0 sec. = No delay
0 s	Delay Time OFF	0	Mode OFF: Relay is only deactivated at the end of the defined time (sec.) 0 sec. = No delay

3.6 Menu MP Parameters

Display and change of MP parameters including activation of measuring points and assignment of alarm relays
The presentation of the MP parameters depends on the installed software. See 3.4 Menu Measuring Values.





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3.6.1 Activate – Deactivate MP

Symbol	Description	Setting Status	Function
MP 01	Measuring point		Selection MP No.
Active	MP Mode	Not active	Active = Measuring point activated at the controller Not active = Measuring point not activated at the controller

3.6.2 Selection Gas Type

Assign gas type to attached gas transmitters.

Symbol	Description	Setting Status	Gas type		Unit	Measuring range[1]
MP 01	Measuring point					
CO	Gas type	CO	CO	Carbon monoxide	ppm	0 – 300
			O2>	Oxygen (increasing)[2]	Vol%	0 – 25
			O3	Ozone	ppm	0 – 5
			TOX	Toxic gas	ppm	0 – XX
			CO2	Carbon dioxide[4]	ppk	0 – 50
			RH	Humidity	% r. F.	0 – 100
			Temp.	Temperature	° C	0 – 50
			R22	Refrigerant gas	ppm	0 – 2000
			R134	Refrigerant gas	ppm	0 – 300
			R123	Refrigerant gas	ppm	0 – 300
			R11	Refrigerant gas	ppm	0 – 300
			R411	Refrigerant gas	ppm	0 – 300
			R410	Refrigerant gas	ppm	0 – 300
			R407	Refrigerant gas	ppm	0 – 300
			R416	Refrigerant gas	ppm	0 – 300
			R404	Refrigerant gas	ppm	0 – 300
			R409	Refrigerant gas	ppm	0 – 2000
			R408	Refrigerant gas	ppm	0 – 2000
			R402	Refrigerant gas	ppm	0 – 2000
			R401	Refrigerant gas	ppm	0 – 2000
			VOC	Air quality	ppm	0 – 2000
			ETC	Ethylene oxide	ppm	0 – 20
			Cl2	Chlorine	ppm	0 – 100
			H2S	Hydrogen sulphide	ppm	0 – 200
			SO2	Sulphur dioxide	ppm	0 – 100
			Ex	Carbon dioxide[5]	ppm	0 – 2000
			O2<	Oxygen (falling)[3]	Vol%	0 – 25
			NH3	Ammonia	ppm	0 – 300
			NO2	Nitrogen dioxide	ppm	0 – 25
			NO	Nitrogen oxide	ppm	0 – 50
			Ex	Combustible gas	%LEL	0 – 100

[1] Recommendation without obligation
[2] Oxygen measurements: Alarm at increasing concentration
[3] Oxygen measurements: Alarm at falling concentration
[4] Carbon dioxide measurements with unit ppk (1 vol% = 10 ppk)
[5] Carbon dioxide measurements with unit ppm (1 vol% = 10.000 ppm)

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3.6.3 Measuring Range

The measuring range can be defined arbitrarily between 10 and 10000. The measuring ranges in the table gas type are only recommendations without obligation.

The measuring range must agree with the range of the attached gas transmitter.

3.6.4 MP Signal

Gas transmitters using electro-chemical or catalytic beat gas sensors normally produce a linear signal, proportional to the gas concentration.

Semiconductor gas sensors produce a non-linear (exponential) signal due to their measuring principle. This signal leads to a non-linear output signal of the gas transmitter (only for µGard analog transmitters).

The Gas Controller DGC-03 is prepared for both types, for gas transmitters with linear signal as well as for µGard analog transmitters with semiconductor sensor and non-linear signal. The signal type is defined in this menu.

Symbol	Description	Setting Status	Function
MP 01	Measuring Point		Selection of MP No.
Linear	MP Signal	Linear	Linear = Transmitter with linear output signal Non linear = Transmitter with non-linear output signal

3.6.5 Threshold / Hysteresis

For each measuring point four alarm thresholds are available for free definition. If the gas concentration exceeds the adjusted alarm threshold, the associated alarm is set. If the gas concentration falls below the alarm threshold inclusive hysteresis the alarm is reset again.

Unused alarm thresholds have to be defined with full scale value, in order to avoid false alarms.

For O_2 measurement: Pay attention to the alarm activation at decreasing or increasing concentration!

Symbol	Description	Default Status		Function
MP 01	Measuring Point			Selection MP No.
40 ppm	Threshold	40 80 100 120 15	Threshold 1 Threshold 2 Threshold 3 Threshold 4 Hysteresis	Gas concentration > Threshold 1 = Alarm 1 Gas concentration > Threshold 2 = Alarm 2 Gas concentration > Threshold 3 = Alarm 3 Gas concentration > Threshold 4 = Alarm 4 Gas concentration < (Threshold X –Hysteresis) = Alarm X OFF

3.6.6 Delay of Alarm ON or OFF

Definition of alarm ON and/or alarm OFF delay. The function applies to all alarms of an MP.

Symbol	Description	Default Status	Function
MP 01	Measuring Point		Selection of MP No.
0 s	Delay Time ON	0	Gas concentration > Threshold: Alarm is only activated at the end of the fixed time (sec.). 0 sec. = No Delay
0 s	Delay Time OFF	0	Gas concentration < Threshold: Alarm is only deactivated at the end of the fixed time (sec.). 0 sec. = No Delay

The delayed activation of an existing gas alarm can cause damage to persons and objects.
The commissioning technician and/or the operator are solely responsible for the activation.

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3.6.7 Control Mode

Definition of the alarm evaluation by means of current (CV) or average value (AV).

Symbol	Description	Default Status t	Function
MP 01	Measuring Point		Selection of MP No.
CV	Evaluation	CV	CV = Control by the current gas value AV = Control by the average gas value

Current- average value function see: 3.7.4

3.6.8 MP Fault Assigned to Alarm

Definition, which alarms are activated in case of a fault at the measuring point.

Symbol	Description	Default Status	Function
MP 01	Measuring Point		Selection of MP No.
Alarm - 1 2 3 4 Fault - 1 1 0 0	Fault MP	1 1 0 0	0 = Alarm not set at MP fault 1 = Alarm set at MP fault

3.6.9 Alarm Assigned to Alarm Relay

Each of the 4 alarms can be assigned to any alarm relay. Unused alarms are not assigned to any alarm relay.

Symbol	Description	Default Status	Function
MP 01	Measuring Point		Selection of MP No.
1	A1 A2 A3 A4	01 02 03 00	01 = Alarm 1 activates alarm relay R 01 02 = Alarm 2 activates alarm relay R 02 03 = Alarm 3 activates alarm relay R 03 04 = Alarm 4 doesn't activate any alarm relay

3.6.10 MP Signal Assigned to Analog Output

The measuring point signal can be assigned to the analog output. At this the signal defined in the control mode (current or average value) is transmitted.

Analog output see also: 3.7.2

Symbol	Description	Default Status	Function
MP 01	Measuring Point		Selection of MP No.
0	A	0	0 = MP Signal not assigned to analog output 1 = MP Signal assigned to analog output 1

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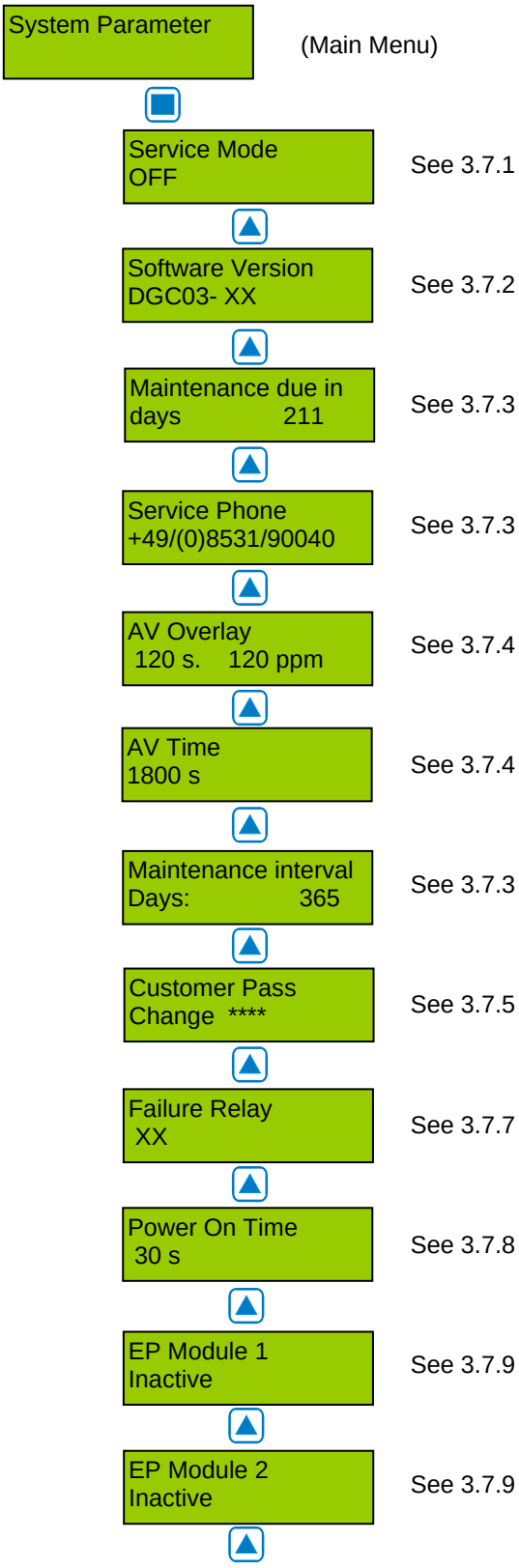
3.7 Menu System Parameters

Displays and changes the system parameters of the Gas Controller module.



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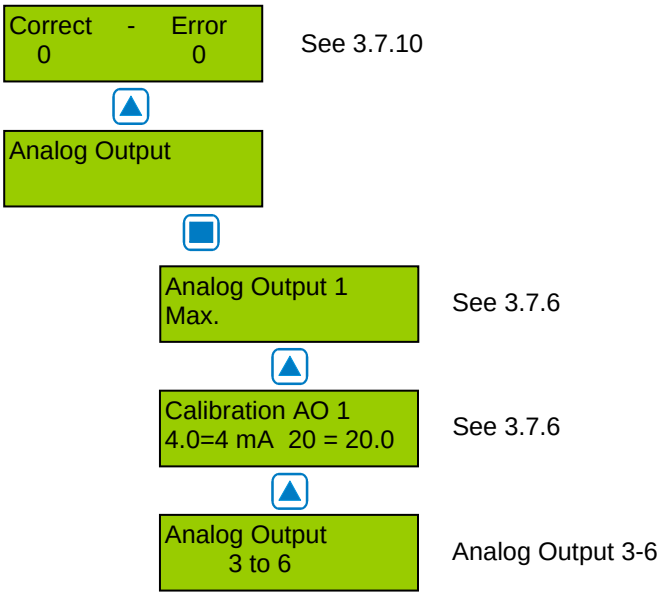

3.7.1 Service Mode

When the service mode is active (ON) the alarms are not transmitted to the alarm relays (in case of calibration or service work). The service mode ON is reset automatically after 60 minutes or manually in the menu “Service Mode”.

Symbol	Description	Default Status	Function
Off	Service Mode	Off	Off = Alarms activate the associated alarm relays On = Alarms are not transmitted to the alarm relays

3.7.2 Software Version

Symbol	Description	Default Status	Function
DGC03-XX	Software Version		XX = Software Version

3.7.3 Maintenance Concept

Integrated in the DGC-03 system there is a control of the maintenance intervals required by law or by the customer. At commissioning or after maintenance the number of days until the next due maintenance is entered = Reset of the maintenance message (service phone no.). When the days counter reaches zero, the failure signal is activated the following morning at 9 o’clock, and the phone no. of the service technician occurs in the display. The remaining days until the next maintenance can be read from the menu “Maintenance in “.

The service phone no. can be entered individually in the next menu.

Symbol	Description	Default Status	Function
XXX	Maintenance in		Remaining days until the next maintenance
XXX	Maintenance interval		Reset of the maintenance message by entering the number of days until the next maintenance
0853....	Phone No.		Input of the individual service phone no.

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3.7.4 Average Function

For each active measuring point the Gas Controller module calculates the arithmetic average value out of 10 measurements got within the time unit defined in the menu “AV Time“. This average value is indicated in the menu “Measuring Values” next to the current value. At each measuring point the control mode (current or average value) is defined for the alarm evaluation.

The alarm evaluation of the control mode average value is overlaid by the current value, when the current value exceeds the alarm threshold defined in the menu “AV Overlay“. The overlay is delayed by the time factor defined in this menu. With time factor 0 sec. the overlay is not active.

Symbol	Description	Default Status	Function
120 s 120 ppm	AV Overlay	120 s 120 ppm	sec. = Delay time of average value overlay. 0 = No overlay function ppm = Alarm threshold of average overlay
1800 s	AV Time	1800 s	sec. = Time for the calculation of the average value

3.7.5 Customer Password (Code 4)

Change the system password for level 4

Symbol	Description	Default Status	Function
XXXX	Customer Password		XXXX = Definition of an individual 4-digit customer’s password (level 4)

3.7.6 Analog Output

The Gas Controller has up to 5 analog outputs (AO) with 4 to 20 mA signal. The signal of one or more measuring points can be assigned to each analog output. The assignment is performed in the menu “MP Parameters” for each MP. The measuring point sends the signal as defined in the menu “C/A Mode” (CV or AV).

Out of the signals of all assigned measuring points the Gas Controller module determines the minimum, the maximum or the average value and transmits it to the analog output. The definition, which value is transmitted, is effected in the menu “Analog Output X“.

In mA mode, each analog output can be calibrated at 4 or at 20 mA. Therefore an ampere meter (measuring range 25 mA) can be attached to the AO and the respective factor has to be changed until the analog output corresponds to 4 or 20 mA. During calibration evaluation of the measuring point signals is not possible. This calibration is effected by the factory. The factors shall not be changed.

Symbol	Description	Default Status	Function
Max.	Select Output Mode	Max.	Min. = Displays the minimum value of all assigned MP Max. = Displays the maximum value of all assigned MP Average = Displays the average value of all assigned MP
4.0 20.0	Calibration	4.0 20.0	4. = Calibration factor at 4 mA 20.0 = Calibration factor at 20 mA

3.7.7 Define the Fault Relay

Definition of the fault relay. See also fault management (3.1)

Symbol	Description	Default Status	Function
X	Fault Relay	R X	RX = Define the fault relay

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3.7.8 Power On Time

Gas sensors need a running-in period, until the chemical process of the sensor reaches stable conditions. During this running-in period the current signal can lead to an unwanted releasing of a pseudo alarm. Therefore the power on time is started at the Gas Controller module after having switched on the power supply. While this time is running out, the Gas Controller does not activate any alarms. The power on status occurs in the starting menu.

Symbol	Description	Default Status	Function
30 s	Power On Time	30 s	XX = Define the power on time (sec.)

3.7.9 Registration of Extension Modules

The DGC-03 can manage up to two expansion modules EP-05 with five alarm relays each. Each attached EP-05 is registered in this menu. The controller checks the communication to the registered EP-05 modules and shows a fault signal in case of a communication error. In order to recognize the position of the EP-05 modules, a module address is assigned to each module by the address selector. See table.

The table shows the assignment of the relay numbers to the individual modules.

Symbol	Description	Default Status	Function	Module Address	Relay No.	Analog Output
Not active	EP- Module 1	Not active	Active = Module registered Not active = Module not registered	1	05 to 10	03 to 04
	EP- Module 2	Not active		2	11 to 15	05 to 06

3.7.10 Error Indicator System Bus

All data packets received by the DGC-03 are checked for completeness and compatibility. Faulty data packets are recorded by the error counter. Max. 1-2 faulty data packets are admissible a day.

A higher error rate mostly comes from incorrect laying of the field bus line.

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4 Part Disposal

Since August 2005 there are EC-wide directives defined in the EC Directive 2002/96/EC and in national codes concerning the waste electrical and electronic equipment and also regarding this device.

For private households there are special collecting and recycling possibilities. For this device isn't registered for the use in private households, it mustn't be disposed this way. You can send it back to your national sales organisation for disposal. If there are any questions concerning disposal please contact your national sales organisation.

Outside the EC, you have to consider the corresponding directives.

5 Notes and General Information

It is important to read this user manual carefully in order to understand the information and instructions. The PolyGard® DGC-03 gas monitoring, control and alarm system may only be used for applications in accordance to the intended use. The appropriate operating and maintenance instructions and recommendations must be followed.

Due to permanent product developments, MSR reserves the right to change specifications without notice. The information contained herein is based on data considered to be accurate. However, no guarantee or warranty is expressed or implied concerning the accuracy of these data.

5.1 Intended Product Application

The PolyGard® DGC-03 is designed and manufactured for controlling, for saving energy and keeping OSHA air quality in commercial buildings and manufacturing plants (i.e. detection and automatic exhaust fan control for automotive maintenance facilities, enclosed parking garages, engine repair shops, warehouses with forklifts, fire stations, tunnels, etc.).

5.2 Installers` Responsibilities

It is the installer's responsibility to ensure that all PolyGard® DGC-03 are installed in compliance with all national and local regulations and OSHA requirements. All installations shall be executed only by technicians familiar with proper installation techniques and with codes, standards and proper safety procedures for control installations and the latest edition of the National Electrical Code (ANSI/NFPA70). It is also essential to follow strictly all instructions as provided in the user manual.

5.3 Maintenance

We recommended checking the PolyGard® DGC-03 system regularly. Due to regular maintenance differences in efficiency can easily be corrected.

5.4 Limited Warranty

MSR warrants the PolyGard® DGC-03 against defects in material or workmanship for a period of one (1) year beginning from the date of shipment. Should any evidence of defects in material or workmanship occur during the warranty period, MSR will repair or replace the product at their own discretion, without charge.

This warranty does not apply to units that have been altered, had attempted repair, or been subjected to abuse, accidental or otherwise. The above warranty is in lieu of all other express warranties, obligations or liabilities.

This warranty applies only to the PolyGard® DGC-03. MSR shall not be liable for any incidental or consequential damages arising out of or related to the use of the PolyGard® DGC-03.

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